

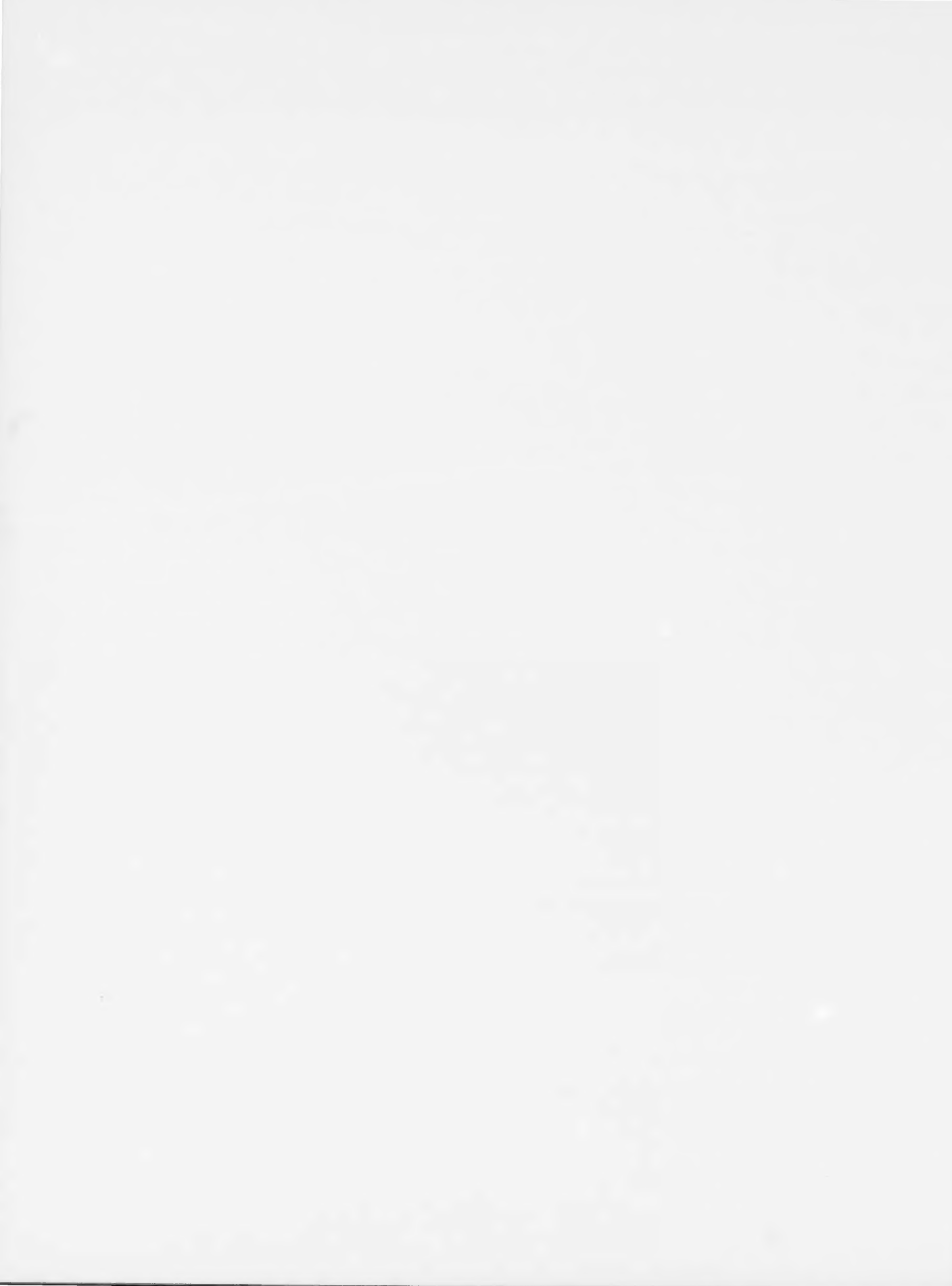
OCCUPATIONAL ANALYSES SERIES

Metal Fabricator (Fitter)



2003





Occupational Analyses Series

Metal Fabricator (Fitter)

2003

Policy and Apprenticeship Division

Division des politiques et
de l'apprentissage

Human Resources
Partnerships Directorate

Direction des partenariats
en ressources humaines

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charpentes métalliques

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The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this Occupational Analysis as the national standard for the occupation of Metal Fabricator (Fitter).

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This analysis was prepared by the Human Resources Partnerships Directorate of HRDC. The planning, coordination and processing of the analysis were undertaken by staff members of the Policy and Apprenticeship Division.

OTHER RELATED OCCUPATIONAL TITLES

This analysis covers tasks performed by a metal fabricator (fitter) whose occupational title has been identified by some provinces and territories of Canada under the following names:

- Fitter (Structural Steel/Platework)
- Metal Fabricator
- Steel Fabricator
- Steel Fabricator (Fitter)
- Structural Steel and Plate Fitter
- Welder/Fitter

LIST OF PUBLISHED OCCUPATIONAL ANALYSES *

TITLE	NOC** Code
Appliance Service Technician (1997)	7332
Aquaculture Technician (1977)	2221
Arts Administrator (1989)	0114
Automotive Painter (1995)	7322
Automotive Service Technician (1998)	7321
Automotive Technician - Automatic Transmission (1990)	7321
Automotive Technician - Electrical/Electronics (1992)	7321
Automotive Technician - Engine Repair and Fuel Systems (1989)	7321
Automotive Technician - Front-End (1989)	7321
Automotive Technician - Manual Transmission, Driveline and Brakes (1990)	7321
Aviation Machinist (1994)	7231
Baker (1997)	6252
Blaster (Surface) (1987)	7372
Boilermaker (2003)	7262
Bricklayer (2000)	7281
Cabinetmaker (2000)	7272
Carpenter (1998)	7271
Cement Finisher (1995)	7282
Construction Electrician (2003)	7241
Cook (2003)	6242
Electrical Rewind Mechanic (1999)	7333
Electronics Technician - Consumer Products (1997)	2242
Electronics Technician Vol. I (1986) (Video Equipment)	2242

* Red Seal analyses are indicated in bold

** National Occupational Classification

Electronics Technician Vol. II (1986) (Audio Equipment)	2242
Electronics Technician Vol. III (1986) (Computer Equipment)	2242
Electronics Technician Vol. IV (1986) (Office Equipment)	2242
Electronics Technician Vol. VI (1986) (Communication Equipment)	2242
Electronics Technician Vol. VII (1986) (Signaling Equipment)	2242
Electronics Technician Vol. VIII (1986) (Navigation Equipment)	2242
Electronics Technician Vol. IX (1986) (Video Game Equipment)	2242
Electronics Technician Vol. X (1987) (CADD Equipment)	2242
Electronics Technician Vol. XI (1987) (CAM Equipment)	2242
Electronics Technician Vol. XII (1987) (Robotics Equipment)	2242
Electronics Technician Vol. XIII (1987) (Biomedical and Laboratory Equipment)	2242
Electronics Technician Vol. XIV (1987) (Industrial Process-Control Equipment)	2243
Farm Equipment Mechanic (2000)	7312
Floorcovering Installer (1997)	7295
Glazier (1994)	7292
Hairstylist (1997)	6271
Heating (Gas and Oil) Servicer - Commercial and Industrial (1978)	7331
Heavy Duty Equipment Mechanic (1998)	7312
Heavy Equipment Operator (1983)	7421
Industrial Electrician (2003)	7242
Industrial Instrument Mechanic (2000)	2243
Industrial Mechanic (Millwright) (1999)	7311
Insulator (Heat and Frost) (2000)	7293
Ironworker (Generalist) (1993)	7264
Lather (Interior Systems Mechanic) (2002)	7284

Logistics (1992)	0713
Machinist (1998)	7231
Major Electrical Appliance Repairer (1984)	7332
Metal Fabricator (Fitter) (2003)	7263
Mobile Crane Operator (1997)	7371
Motorcycle Mechanic (1995)	7334
Motor Vehicle Body Repairer (Metal and Paint) (1997)	7322
New Home Builder and Residential Renovation Contractor (1992)	0712
Oil Burner Mechanic (1997)	7331
Painter and Decorator (2000)	7294
Partsperson (1995)	1472
Plumber (2003)	7251
Power Engineer (1997)	7351
Powerline Technician (1996)	7244
Recreation Vehicle Mechanic (2000)	7383
Refrigeration and Air Conditioning Mechanic (1997)	7313
Roofer (1997)	7291
Sheet Metal Worker (1997)	7261
Sprinkler System Installer (2003)	7252
Steamfitter-Pipefitter (1996)	7252
Tool and Die Maker (1997)	7232
Transport Trailer Technician (2003)	7321
Truck and Transport Mechanic (2000)	7321
Welder (1996)	7265

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Human Resources Development Canada
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Gatineau, Quebec K1A 0J9

FOREWORD

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to co-operate with provincial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, Human Resources Development Canada sponsors a program, under the guidance of the Canadian Council of Directors of Apprenticeship (CCDA), to develop a series of occupational analyses.

The Occupational Analysis Program has the following objectives:

- to identify and group the tasks performed by skilled workers in particular occupations;
- to identify those tasks that are performed by skilled workers in every province and territory;
- to develop instruments for use in the preparation of interprovincial standards "Red Seal" examinations and curricula for training leading to the certification of skilled workers;
- to facilitate the mobility, in Canada, of trainees and skilled workers;
- to supply employers and employees, and their associations, industries, training institutions and governments with analyses of the tasks performed in particular occupations.



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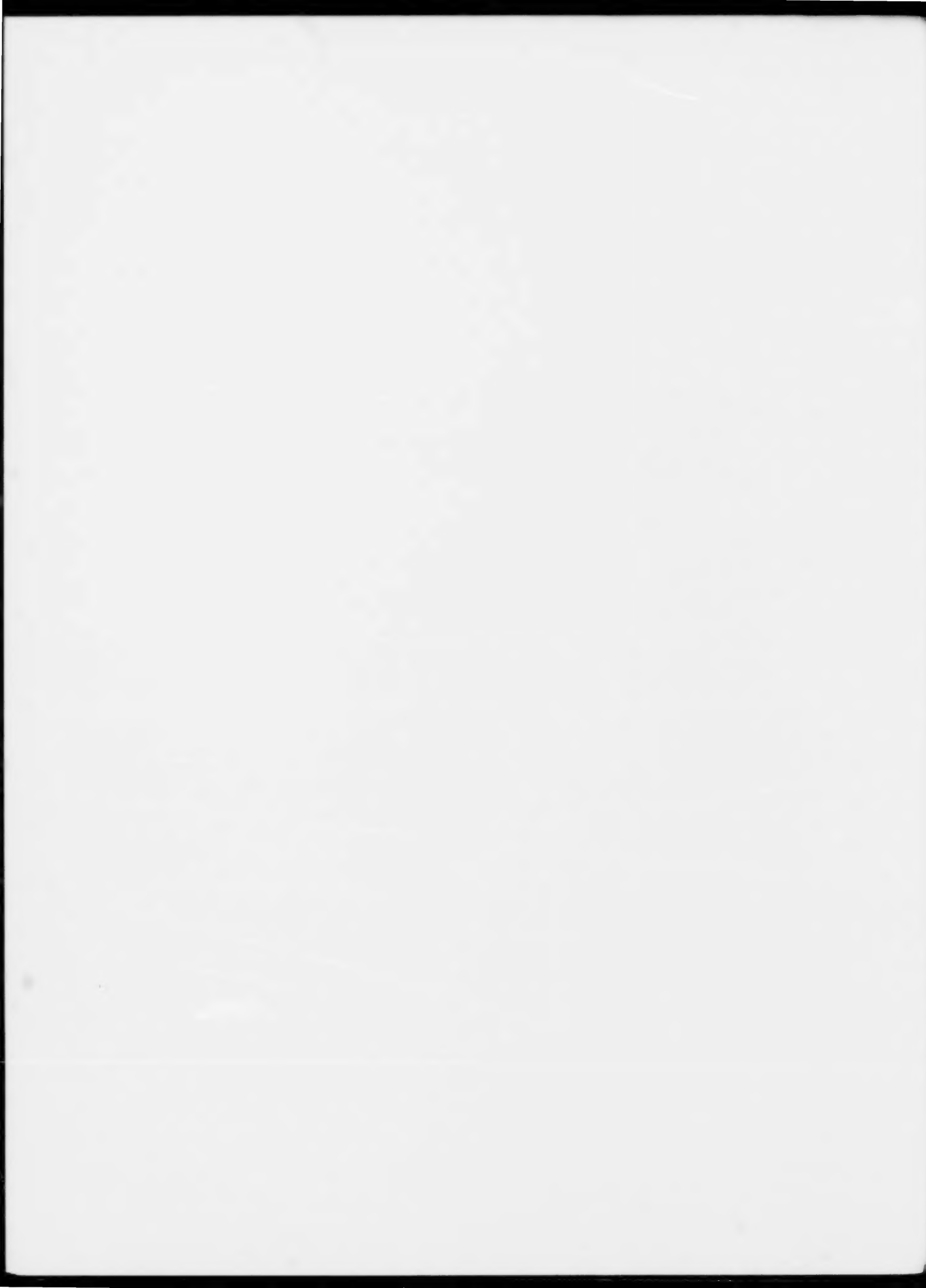
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GUIDE TO ANALYSIS



DEVELOPMENT OF ANALYSIS

A draft analysis is developed by a knowledgeable consultant who, with the assistance of a committee of industry experts in the field, identifies all the tasks performed in the occupation.

The draft is then assigned to occupational analysts at Human Resources Development Canada for translation and then returned to the consultant for review to ensure conformity with the nationally approved format.

The consultant will then forward a copy of this analysis to provincial and territorial authorities for validation by specialists in the field. Their recommendations are assessed and incorporated into the final draft which also includes the identification of the common core tasks performed in the occupation.

The occupational analysis is published in both official languages.

STRUCTURE OF ANALYSIS

To facilitate the understanding of the nature of the occupation, the work performed is divided into the following divisions:

- A. **BLOCK** - is the largest division within the analysis and reflects a distinct operation relevant to the occupation.
- B. **TASK** - is the distinct activity that, combined with others, makes up the logical and necessary steps the worker is required to perform to complete a specific assignment within a "BLOCK".
- C. **SUB-TASK** - is the smallest division into which it is practical to subdivide any work activity and, combined with others, fully describes all duties constituting a "TASK".

Supporting Knowledge & Abilities

The element of skill and knowledge that an individual must acquire to adequately perform the task is identified under this heading.

Trends

Any shifts or changes in technology that affect the block are identified under this heading.

Related Components

All components of a specified task being undertaken by the metal fabricator (fitter) are identified under this heading.

Tools and Equipment

All tools and equipment necessary for the metal fabricator (fitter) to complete a task are identified under this heading.

VALIDATION METHOD

At the request of the Canadian Council of Directors of Apprenticeship (CCDA), the Standardization sub-committee developed a method for the validation of the national Red Seal occupational analyses.

A draft of the analysis is sent to all provinces and territories for validation. Each jurisdiction rates the sub-tasks and applies percentage ratings to blocks and tasks. This method for the validation of the national occupational analysis identifies common core tasks across Canada for a specific occupation. This feature facilitates the weighting of the interprovincial Red Seal examinations.

DEFINITIONS

- YES:** the sub-task is performed by workers in the occupation in a specific jurisdiction.
- NO:** the sub-task is not performed by workers in the occupation in a specific jurisdiction.
- BLOCK %:** the average number of questions (items), derived from the collective decision made by workers within the occupation from all areas of Canada, which will be placed on an interprovincial examination to assess each block of the analysis.
- TASK %:** the average number of questions (items), derived from the collective decision made by workers within the occupation from all areas of Canada, which will be placed on an interprovincial examination to assess each task of the analysis.
- NV:** Not Validated by a province or a territory.
- ND:** Not Designated in a province or a territory.

PROVINCIAL AND TERRITORIAL ABBREVIATIONS

- NL:** Newfoundland and Labrador
- NS:** Nova Scotia
- PE:** Prince Edward Island
- NB:** New Brunswick
- QC:** Quebec
- ON:** Ontario
- MB:** Manitoba
- SK:** Saskatchewan
- AB:** Alberta
- BC:** British Columbia
- NT:** Northwest Territories
- YK:** Yukon
- NU:** Nunavut

COMMON CORE

The criteria for determining common core depend on the performance of sub-tasks. If 70% of the responding jurisdictions (excluding NVs and NDs) perform a sub-task, it shall be considered common core.

Interprovincial Red Seal examinations are based on the common core identified through this validation process. This process identifies what will be assessed through the interprovincial examination.

BLOCKS AND TASKS WEIGHTING (APPENDIX "C")

This appendix represents the block and task percentages as submitted by each jurisdiction.

Each jurisdiction, with the use of a provincial or a territorial occupational advisory committee, validates the content, places percentages on blocks and tasks, and indicates whether or not the sub-tasks are performed by the skilled workers within the occupation. The results of this exercise are submitted to the consultant who then analyzes the data and develops this appendix which provides the individual jurisdictional validation results as well as the national averages of all responses.

PIE CHART (APPENDIX "D")

The graph depicts the national percentages assigned to blocks in the analysis.

SCOPE OF THE METAL FABRICATOR (FITTER) OCCUPATION

Metal fabricators (fitters) are individuals who work with ferrous and non-ferrous metals, including plate and structural steel sections, to produce or repair component parts for bridges, buildings, towers, platforms, steel stairs and hand rails or other assemblies and structures made from steel.

Individuals in this occupational group can be found employed in structural steel and manufacturing plants as well as in heavy machinery and ship building companies. They may be requested to fabricate pressure vessels, structural steel, boilers, tanks, shells, chutes, hoppers, stacks and other heavy steel components on a custom-made basis and often includes the fitting and installation of components for process equipment.

Metal fabricators (fitters) will be further called upon to perform some or all of the following duties: blueprint reading, planning and preparing jobs, mechanical drafting for pattern development, fabricating components, assembling components and installing components.

Metal fabricators must be able to use a variety of hand or power tools and specialized machinery. The occupation requires, above average spatial perception, good co-ordination, mechanical aptitude and manual dexterity, knowledge of related mathematics and workplace regulations. Other essential skills are: the ability to interpret drawings, to develop a logical sequence of operations and to layout and mark steel for cutting, burning, sawing, shearing, punching, rolling, bending and drilling, shaping, forming, straightening; then fitting and assembling these components. Metal fabrication includes welding, bolting, riveting, testing, inspecting, priming, painting, rigging, and handling of subcomponents and the final product.

Related occupations in all parts of Canada include ironworkers, welders and boilermakers. Occupational colleagues to metal fabricators include estimators, structural-steel draughtsman (detailers) and sheet metal workers who prepare shop drawings for structures using structural and plate steel to fabricate integral parts, and welders who, using various welding equipment, weld the assemblies together after fabrication.

OCCUPATIONAL OBSERVATIONS

Some significant trends emerged from this national occupational analysis of the metal fabricator (fitter) occupation. These trends are outlined in this section.

Information generated by our panel of expert metal fabricators (fitters) indicates that the metal fabricator trade has retained most of its traditional competency requirements. However, technological innovations are influencing skill requirements, impacting on workers, affecting productivity and improving workplace safety. A number of modern methods, tools, automated machines, personal protective devices and measuring devices find their way into this occupation on a regular basis. Due to the increased number and diversity of stringent safety regulations, legislation impacts greatly on companies and workers in this trade.

In the job planning and preparation blocks of skills, one can observe several tendencies. The computer assisted design system (CAD) is growing in use, dramatically changing the work environment and gaining in popularity. More electronic, digital and laser measuring devices can be found in the work place. They are more user friendly and increasingly more accurate. An increased use of electronic communication techniques and devices (cell phones, palm held units, email, fax) facilitates the exchange of job estimates and management of projects in the workplace. And, due to the globalization of business opportunities, we see an increased use of quality control assurance standards and metrication.

Technological innovations extend into the fabrication and assembly of component blocks in a number of ways. We see an increase in the use of: remote control equipment, cranes with computer load charts, battery back-ups on magnetic lifts, automated fabricating processes for specialized products, automated welding helmet lenses, preset bolts with torques built into the fasteners, better coating materials, numerical control (NC) and computer numerical controlled (CNC) equipment for bending, cutting, measuring and drilling and various devices for tracking materials (plasma markers, bar code scanners and use of colour).

Some companies out-source their production to specialty shops (cutting, detailing, bending, rolling, powder coating) while others choose to concentrate on manufacturing more pre-engineered building components and fabricating larger assemblies in their shops due to improved transportation systems.

The scope of practice varies somewhat across the country and there appears to be a trend for metal fabricators (fitters) to seek additional certification as welders. In turn, these individuals become more involved in preparing and installing fabricated components at job sites.

SAFETY

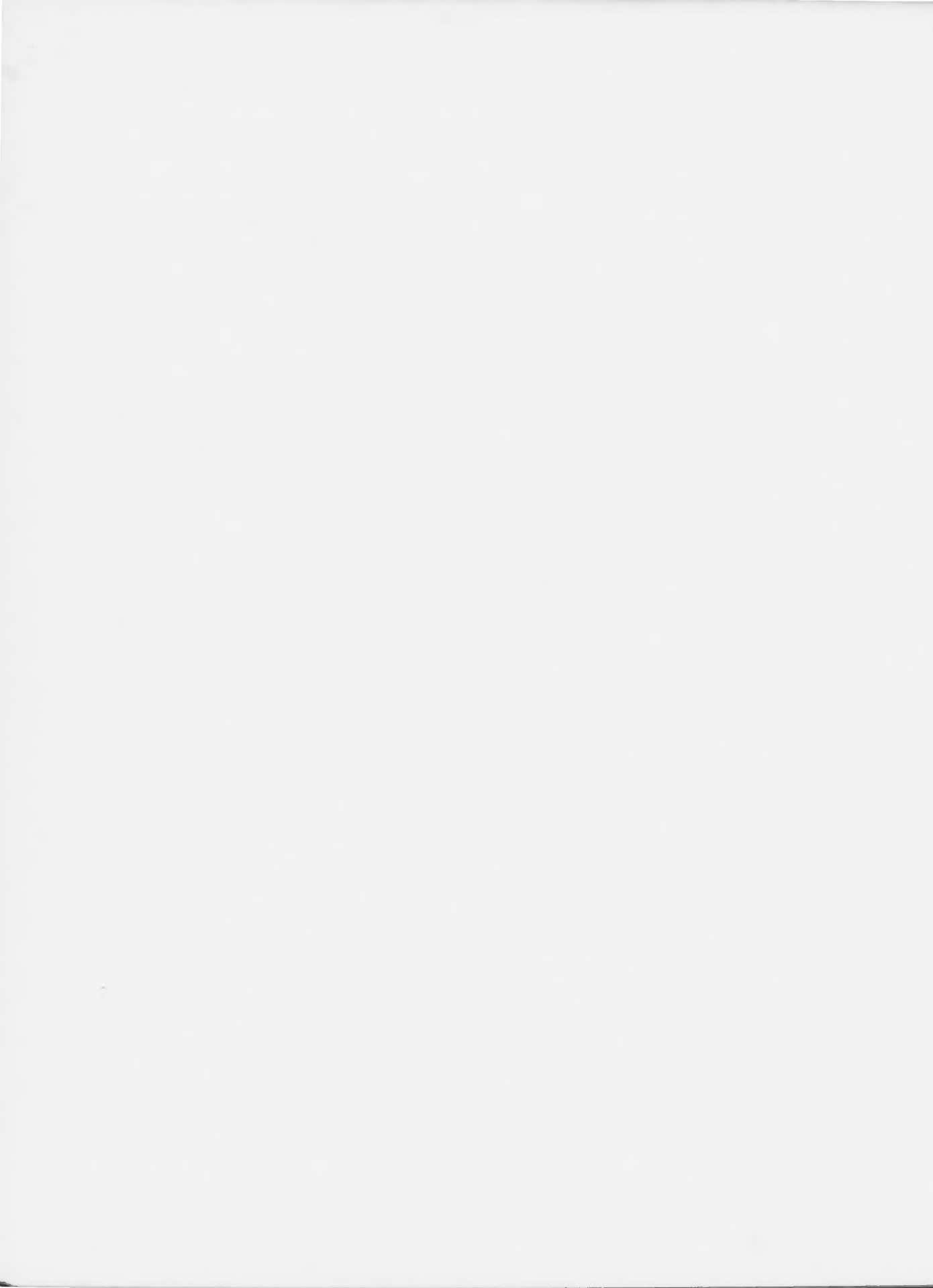
Safe working procedures and conditions, accident prevention and the preservation of health are of primary importance to industry in Canada. These responsibilities are shared and require the joint efforts of government, employers and employees. It is imperative that all parties become aware of circumstances that may lead to injury or harm. Safe learning experience and environments can be created by controlling the variables and behaviours that may contribute to accidents or injury.

It is generally recognized that a safety-conscious attitudes and work practices contribute to a healthy, safe and accident-free working environment.

It is imperative to apply and be familiar with the Occupational Health and Safety Act and Regulations. As well, it is essential to determine workplace hazards and take measures to protect oneself, co-workers, the public and the environment.

As safety education is an integral part of training in all jurisdictions, personal safety practices are not recorded in this document. However, the technical safety aspect relating to each task and sub-task are included throughout this analysis.

ANALYSIS



BLOCK A

OCCUPATIONAL SKILLS

Trends: More modern methods, tools, automated machines, safety devices and measuring devices are being introduced into the trade on a regular basis. The computers assisted design system (CAD) has dramatically changed the workers milieu and is gaining in popularity. Increased number and diversity of stringent safety regulations and legislations impact greatly on workers and their work environment.

Task 1 Demonstrates common trade practices.

Related Documents: WHMIS regulations, SOP manual, manufacturers' safety manuals, occupational health and safety regulations, QA manuals.

Tools and Equipment: Personal protective equipment.

Sub-task

1.01 Uses personal protective equipment.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- | | |
|---------|---|
| 1.01.01 | knowledge of WHMIS |
| 1.01.02 | knowledge of safety regulations |
| 1.01.03 | knowledge of types of equipment required for specific jobs, applications or hazards |
| 1.01.04 | knowledge of operations of personal protective equipment |
| 1.01.05 | knowledge of safe work practices |
| 1.01.06 | ability to utilize safety equipment |
| 1.01.07 | ability to read and interpret material safety data sheet (MSDS) |
| 1.01.08 | ability to adjust personal protective equipment |
| 1.01.09 | ability to apply and remove personal protective equipment |

Sub-task

1.02 Complies with current codes and regulations. Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 1.02.01 knowledge of codes and regulations
- 1.02.02 knowledge of WHMIS, hazardous and dangerous goods
- 1.02.03 ability to interpret codes and regulations

Sub-task

1.03 Follows standard operating procedures (SOP). Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 1.03.01 knowledge of SOP
- 1.03.02 knowledge of location for SOP documents
- 1.03.03 ability to read and comprehend SOP
- 1.03.04 ability to comply with SOP

Sub-task

1.04 Maintains safe working area. Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 1.04.01 knowledge of potential hazards
- 1.04.02 knowledge of safe working procedures
- 1.04.03 knowledge of emergency plan and procedures
- 1.04.04 ability to perform housekeeping duties
- 1.04.05 ability to identify hazards

Supporting Knowledge & Abilities

- 1.04.06 ability to correct hazards
- 1.04.07 ability to implement emergency plan
- 1.04.08 ability to establish a safe work area

Task 2 Utilizes various shop drawings, sketches and fabrication drawings.

Related Documents:

Reference manual for codes, materials and steel handbook, welding symbols handbook, metal trades handbook, contract specification.

Tools and Equipment:

Basic drafting equipment, blueprint reading scales, blueprint production equipment, CAD, computer equipment, drafting scale ruler, email, fax machine, photocopier, scientific calculator.

Sub-task

2.01 Interprets drawings.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 2.01.01 knowledge of types and formats of drawings
- 2.01.02 knowledge of drawing conventions
- 2.01.03 knowledge of three dimensional drawings
- 2.01.04 knowledge of welding symbols
- 2.01.05 ability to take field dimensions and produce a sketch
- 2.01.06 ability to submit field dimensions for incorporation into shop drawings
- 2.01.07 ability to visualize a finished product
- 2.01.08 ability to read notes
- 2.01.09 ability to read drawings in imperial and metric dimensions

Supporting Knowledge & Abilities

- 2.01.10 ability to recognize symbols and abbreviations
- 2.01.11 ability to interpret sectional views
- 2.01.12 ability to transfer dimensional measurements to specific materials

Sub-task**2.02 Interprets engineering specifications.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	no	yes	yes	ND	ND	ND

- 2.02.01 knowledge of codes incorporated into specifications
- 2.02.02 knowledge of shop and customer standards
- 2.02.03 ability to implement engineering specifications into actual components
- 2.02.04 ability to incorporate codes into specifications
- 2.02.05 ability to read abbreviations

Sub-task**2.03 Creates bill of materials.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 2.03.01 knowledge of materials
- 2.03.02 knowledge of metric and imperial systems
- 2.03.03 knowledge of available materials
- 2.03.04 knowledge of nesting
- 2.03.05 knowledge of equipment used in various processes

Supporting Knowledge & Abilities

- 2.03.06 ability to perform conversions between imperial and metric systems
- 2.03.07 ability to itemize
- 2.03.08 ability to make allowances for forming and cutting material

Task 3 Employs tools, equipment and measuring instruments.

Related Documents: Shop drawings and sketches, operating manuals, SOPs.

Tools and Equipment: Personal protective equipment, basic hand tools, basic power tools, drafting and other office equipment, welding equipment, rigging equipment, transporting equipment, cutting equipment, layout equipment, bending and shaping equipment, drilling and related equipment, finishing tools and equipment.

Sub-task

3.01 Uses hand tools.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 3.01.01 knowledge of types and function of basic hand tools
- 3.01.02 knowledge of metric and imperial tool sizes
- 3.01.03 knowledge of operating procedures and techniques for hand tools
- 3.01.04 ability to match hand tools to various tasks
- 3.01.05 ability to clean and lubricate hand tools
- 3.01.06 ability to store hand tools

Sub-task

3.02 Operates power tools.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND
							3.02.01	knowledge of types and function of air, electric and hydraulic power tools				
							3.02.02	knowledge of licensing or training requirements prior to use of explosive actuated tools				
							3.02.03	knowledge of capabilities and limitations of air, electric and hydraulic power tools				
							3.02.04	knowledge of power supply requirements for selected power tools				
							3.02.05	ability to select the power tool for the job to be performed				
							3.02.06	ability to clean and lubricate power tools				
							3.02.07	ability to store power tools				

Sub-task

3.03 Operates stationary machinery.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND
							3.03.01	knowledge of welding processes and procedures				
							3.03.02	knowledge of types and functions of stationary machinery				
							3.03.03	knowledge of operating procedures for stationary machinery				
							3.03.04	knowledge of capabilities and limitations of stationary machinery				
							3.03.05	ability to select the stationary equipment for the job to be performed				

Sub-task**3.04 Operates mobile equipment.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 3.04.01 knowledge of types and functions of mobile equipment
- 3.04.02 knowledge of operating procedures for mobile equipment
- 3.04.03 knowledge of capabilities and limitations of mobile equipment
- 3.04.04 ability to select the mobile equipment for the job to be performed
- 3.04.05 ability to interpret manuals

Sub-task**3.05 Uses rigging equipment.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 3.05.01 knowledge of operating procedures and techniques for hoisting and lifting devices
- 3.05.02 knowledge of hoisting and lifting capacities
- 3.05.03 knowledge of hand signals
- 3.05.04 knowledge of mathematics skills
- 3.05.05 knowledge of types and functions of rigging, hoisting, lifting and come alongs
- 3.05.06 knowledge of load charts
- 3.05.07 ability to store rigging, hoisting and lifting devices
- 3.05.08 ability to recognize damaged, worn and defective components of lifting devices and rigging equipment
- 3.05.09 ability to calculate weights of components

Sub-task

3.06 Uses measuring devices.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- | | |
|---------|---|
| 3.06.01 | knowledge of types and functions of measuring devices |
| 3.06.02 | knowledge of metric and imperial measurement and conversion between systems |
| 3.06.03 | knowledge of handling and storing requirements for measuring equipment |
| 3.06.04 | ability to check measuring devices for accuracy and calibration |
| 3.06.05 | ability to convert between metric and imperial measurements |

BLOCK B

JOB PLANNING AND PREPARATION

Trends: Increased use of metric system due to global business necessitates continued utilization of international drawing formats and conventions. Increase use of electronic, digital and laser measuring devices can be found in the workplace. They are more user friendly and becoming more accurate. Increased use of electronic communication devices (mobile phone, email, fax) facilitates the exchange of job estimates and management of projects in the workplace.

Task 4 Receives materials.

Related Documents: Mill test certificates, shipping bills, packing slips, bills of lading, materials and steel handbook.

Tools and Equipment: Chain slings, endless sling assemblies, manilla ropes, mesh slings, plate clamps, spreader bars, synthetic slings, synthetic ropes, wire rope slings, personal protective equipment, material handling equipment.

Sub-task

4.01 Documents receipts of components.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- | | |
|---------|---|
| 4.01.01 | knowledge of mill certificates |
| 4.01.02 | knowledge of bills of lading |
| 4.01.03 | knowledge of packing slips |
| 4.01.04 | ability to match packing slip with shipment |
| 4.01.05 | ability to place or store components |
| 4.01.06 | ability to forward documents |
| 4.01.07 | ability to verify mill certificates |
| 4.01.08 | ability to match materials with mill certificates |
| 4.01.09 | ability to incorporate mill certificates into project documents |

Sub-task**4.02 Coordinates lay down area.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 4.02.01 knowledge of available space
- 4.02.02 ability to sequence required materials
- 4.02.03 ability to determine size of lay down area for shipment
- 4.02.04 ability to unload shipment

Sub-task**4.03 Identifies structural components and pieces.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 4.03.01 knowledge of measuring devices
- 4.03.02 knowledge of structural steel sections
- 4.03.03 knowledge of material safety data sheets
- 4.03.04 ability to match material with mill certificates
- 4.03.05 ability to locate information
- 4.03.06 ability to determine weights
- 4.03.07 ability to use material and steel handbooks

Sub-task**4.04 Identifies consumables.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 4.04.01 knowledge of welding processes and procedures

Supporting Knowledge & Abilities

4.04.02	knowledge of project specifications
4.04.03	knowledge of welding data sheets
4.04.04	ability to interpret welding data sheets
4.04.05	ability to store consumables
4.04.06	ability to forward documentation
4.04.07	ability to match consumables with materials

Task 5 Identifies materials.

Related Documents:

Project specifications, mill test certificates, material and steel handbook, shop drawings, purchase orders, bill of lading.

Tools and Equipment:

Marking devices, tape measure, vernier callipers, micrometers, material thickness gauge, personal protective equipment.

Sub-task

5.01 Verifies materials as per job specifications.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

5.01.01	knowledge of job specifications
5.01.02	ability to store materials according to manufacturer's specifications
5.01.03	ability to match procedures with drawings
5.01.04	ability to match material with mill certificates

Sub-task**5.02 Marks materials.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND
						5.02.01	knowledge of various materials					
						5.02.02	knowledge of methods of marking					
						5.02.03	ability to mark materials to suit finishes					
						5.02.04	ability to use various types of marking equipment					
						5.02.05	ability to use various marking methods					
						5.02.06	ability to match marked material to specific component					

Sub-task**5.03 Sequences required materials.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND
						5.03.01	knowledge of project sequences					
						5.03.02	ability to perform task from start to completion					
						5.03.03	ability to interpret drawings in order to sequence materials					

Sub-task**5.04 Matches consumables to specifications.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND
						5.04.01	knowledge of project specifications					
						5.04.02	ability to select consumables according to specifications					

Task 6 Develops individual job plan and schedule.*Related Documents:*

Blueprints, shop drawings, job specifications, SOP manual, welding symbols handbook.

Tools and Equipment:

Calculator, personal protective equipment.

Sub-task**6.01 Estimates size of project.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	no	ND	ND	ND

- 6.01.01 knowledge of project time
- 6.01.02 knowledge of project weight
- 6.01.03 knowledge of available equipment
- 6.01.04 ability to estimate hours required to complete job
- 6.01.05 ability to calculate percentage of project completed
- 6.01.06 ability to perform scope of the job
- 6.01.07 ability to determine equipment requirements
- 6.01.08 ability to determine assistance requirements
- 6.01.09 ability to plan and coordinate logical sequence of production operations
- 6.01.10 ability to develop flow chart for logical sequence of operations
- 6.01.11 ability to interpret flow chart for logical sequence of operations

Sub-task**6.02 Identifies sub-assemblies.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 6.02.01 knowledge of welding process and procedures

Supporting Knowledge & Abilities

6.02.02	knowledge of fastening techniques
6.02.03	ability to select equipment and tools required for producing sub-assemblies
6.02.04	ability to devise jigs to sub-assemblies

Task 7 Prepares work area and equipment schedules.

Related Documents: Shop drawings, scheduling sheets.

Tools and Equipment: Tape measures, chalk lines, calculators, transits, levels, personal protective equipment.

Sub-task

7.01 Establishes size of area.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

7.01.01	knowledge of work area
7.01.02	ability to determine size of assembly
7.01.03	ability to determine required work area to accommodate assembly including height required
7.01.04	ability to transfer dimensions from drawings to work area
7.01.05	ability to rotate and position components in work area for available space

Sub-task

7.02 Determines equipment requirements.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

7.02.01	knowledge of final assembly
---------	-----------------------------

Supporting Knowledge & Abilities

- 7.02.02 knowledge of types and functions of equipment
- 7.02.03 ability to use designated equipment
- 7.02.04 ability to calculate weight of components

Sub-task

7.03 Determines schedules.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MP</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	no	ND	ND	ND
							7.03.01	knowledge of assembly sequence and procedures				
							7.03.02	knowledge of delivery date				
							7.03.03	knowledge of non-destructive examining requirements				
							7.03.04	ability to determine availability of equipment				
							7.03.05	ability to schedule equipment needs to various stages of fabrication				
							7.03.06	ability to adjust schedules to meet changing circumstances in order to achieve target dates				
							7.03.07	ability to estimate time requirements of needed personnel				

BLOCK C

FABRICATION OF COMPONENTS

Trends: Increased use of remote control equipment. Increased use of automated fabricating processes equipment. Increased use of numerical control (NC) and computer numerical controlled (CNC) equipment for bending and cutting. Increased use of colour and bar code scanners for tracking materials.

Task 8 Handles materials.

Related Documents: Steel handbook, shop drawings, load charts, blueprints, job specifications, SOPs, schedules.

Tools and Equipment: Rigging equipment, measuring devices, crane, hand tools, marking devices, calculator, basic power tools, welding equipment, personal protective equipment.

Sub-task

8.01 Verifies piece marks.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- | | |
|---------|---|
| 8.01.01 | knowledge of weights |
| 8.01.02 | knowledge of physical dimensions |
| 8.01.03 | knowledge of piece marks |
| 8.01.04 | knowledge of types of components |
| 8.01.05 | knowledge of mathematics skills |
| 8.01.06 | knowledge of imperial and metric measurements |
| 8.01.07 | ability to locate piece marks |
| 8.01.08 | ability to verify documentation |
| 8.01.09 | ability to perform a visual inspection |
| 8.01.10 | ability to use measuring devices |
| 8.01.11 | ability to use markers |

Sub-task**8.02 Determines weights.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

8.02.01	knowledge of mathematics skills
8.02.02	ability to read steel handbook
8.02.03	ability to interpret documentation
8.02.04	ability to use scientific calculator
8.02.05	ability to perform mathematical calculations

Sub-task**8.03 Identifies lifting points.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

8.03.01	knowledge of applied physics
8.03.02	knowledge of rigging equipment
8.03.03	ability to perform mathematical calculations
8.03.04	ability to determine centre of gravity

Sub-task**8.04 Matches lifting equipment.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

8.04.01	knowledge of mathematics skills
8.04.02	knowledge of lifting techniques
8.04.03	knowledge of shackles
8.04.04	knowledge of rigging devices
8.04.05	ability to determine capacity of lifting devices

Supporting Knowledge & Abilities

8.04.06	ability to use proper rigging procedures
8.04.07	ability to identify pieces that are to be lifted
8.04.08	ability to identify lifting equipment
8.04.09	ability to apply lifting techniques
8.04.10	ability to select shackles and rigging devices

Sub-task

8.05 Transfers materials.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

8.05.01	knowledge of physics
8.05.02	knowledge of hand signals
8.05.03	knowledge of weights
8.05.04	knowledge of blocking
8.05.05	knowledge of rigging and overhead cranes
8.05.06	knowledge of techniques for transferring materials
8.05.07	ability to secure material for transfer
8.05.08	ability to use a turning bar
8.05.09	ability to roll the material
8.05.10	ability to determine center of gravity

Task 9 Performs layout.*Related Documents:*

Shop drawings and sketches, templates, metal trade handbook.

Tools and Equipment:

Basic hand tools, measuring devices, calculator, layout equipment (as per Appendix "A"), personal protective equipment.

Sub-task**9.01 Prepares materials.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

9.01.01 knowledge of machinery to be used

9.01.02 knowledge of the type of materials

9.01.03 knowledge of consumables

9.01.04 knowledge of drawings

9.01.05 knowledge of welding procedures

9.01.06 knowledge of welding symbols

9.01.07 ability to interpret drawings

Sub-task**9.02 Determines layout methods.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

9.02.01 knowledge of mathematics skills

9.02.02 knowledge of parallel lines, radial lines and triangulation for layout

9.02.03 ability to select layout method

9.02.04 ability to apply appropriate layout method

Sub-task**9.03 Calculates material allowances for various processes.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND
							9.03.01	knowledge of formulas				
							9.03.02	knowledge of mathematics skills				
							9.03.03	knowledge of bending and cutting allowances				
							9.03.04	knowledge of materials				
							9.03.05	knowledge of machinery				
							9.03.06	knowledge of layout tools				
							9.03.07	ability to read charts				
							9.03.08	ability to transfer calculations to workpiece				

Sub-task**9.04 Determines dimensions.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND
							9.04.01	knowledge of measuring instruments				
							9.04.02	knowledge of mathematics skills				
							9.04.03	ability to use measuring devices				
							9.04.04	ability to read drawings and sketches				

Sub-task**9.05 Transfers dimensions.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND
							9.05.01	knowledge of template construction				
							9.05.02	ability to transfer dimensions to marks				

Supporting Knowledge & Abilities

9.05.03 ability to read drawings and sketches

9.05.04 ability to use tools

Sub-task

9.06 Makes templates.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

9.06.01 knowledge of materials

9.06.02 knowledge of various types of templates

9.06.03 knowledge of mechanical drafting

9.06.04 knowledge of machinery

9.06.05 ability to construct a template

9.06.06 ability to use power tools

9.06.07 ability to use welding equipment

9.06.08 ability to use cutting equipment

9.06.09 ability to use hand tools and measuring tools

Sub-task

9.07 Assembles jigs.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

9.07.01 knowledge of drawing specifications

9.07.02 knowledge of type of materials

9.07.03 knowledge of mathematics skills

9.07.04 knowledge of measuring instruments

9.07.05 knowledge of welding techniques and procedures

Supporting Knowledge & Abilities

9.07.06	knowledge of layout
9.07.07	knowledge of hydraulic and pneumatic equipment
9.07.08	knowledge of electrical equipment
9.07.09	ability to tack weld
9.07.10	ability to use hand tools
9.07.11	ability to use power tools

Task 10 Fabricates detail materials.

Related Documents:

Templates, shop drawings and sketches, job specifications, consumables, job schedules, equipment schedules, SOPs, welding symbol handbook, steel handbook.

Tools and Equipment:

Basic hand tools, power tools, forming machinery, bending and shaping equipment, cutting equipment, welding equipment, drilling equipment, personal protective equipment, measuring devices.

Sub-task

10.01 Prepares subassembly requirements.

Supporting Knowledge & Abilities

<u>NL</u> yes	<u>NS</u> yes	<u>PE</u> NV	<u>NB</u> yes	<u>QC</u> NV	<u>ON</u> NV	<u>MB</u> NV	<u>SK</u> yes	<u>AB</u> yes	<u>BC</u> yes	<u>NT</u> ND	<u>YK</u> ND	<u>NU</u> ND
							10.01.01	knowledge of machinery				
							10.01.02	knowledge of material thickness				
							10.01.03	knowledge of welding procedures				
							10.01.04	knowledge of fastening procedures				
							10.01.05	knowledge of coordinate work pieces				
							10.01.06	ability to prepare material for welding				
							10.01.07	ability to prepare material for smoothness and appearance				

Supporting Knowledge & Abilities

10.01.08 ability to construct jigs and fixtures

Sub-task

10.02 Determines method of cutting.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

10.02.01 knowledge of cutting fluids

10.02.02 knowledge of cutting methods

10.02.03 knowledge of machine capacity

10.02.04 knowledge of type of materials

10.02.05 knowledge of various fuels and cutting pressures

Sub-task

10.03 Cuts components.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

10.03.01 knowledge of oxy-fuel cutting

10.03.02 knowledge of preparing cutting lists

10.03.03 knowledge of nesting

10.03.04 knowledge of capacity of machinery to be used

10.03.05 knowledge of mathematics skills

10.03.06 knowledge of blueprint reading

10.03.07 ability to operate cutting machines

10.03.08 ability to prepare cutting lists

10.03.09 ability to cut by hand

Supporting Knowledge & Abilities

10.03.10	ability to cut by using machines
10.03.11	ability to cut to specifications
10.03.12	ability to maintain equipment and machinery
10.03.13	ability to operate oxy-fuel cutting equipment

Sub-task**10.04 Applies parts numbers and piece marks.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND
							10.04.01	knowledge of welding techniques				
							10.04.02	knowledge of finishes of components				
							10.04.03	knowledge of numerical, alphabetical and alphanumeric systems				
							10.04.04	knowledge of dimensioning				
							10.04.05	knowledge of methods of marking				
							10.04.06	ability to identify piece marks				
							10.04.07	ability to use hand tools and power tools				
							10.04.08	ability to weld identification tags				

Sub-task**10.05 Makes holes.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND
							10.05.01	knowledge of drilling				
							10.05.02	knowledge of type of materials				
							10.05.03	knowledge of oxy-fuel/plasma cutting equipment				

Supporting Knowledge & Abilities

10.05.04	knowledge of power tools
10.05.05	knowledge of hydraulic and mechanical machinery
10.05.06	ability to operate equipment according to manufacturer's specifications
10.05.07	ability to determine method of making holes
10.05.08	ability to make the holes according to manufacturer's specifications

Sub-task

10.06 Forms materials.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

10.06.01	knowledge of forming machinery
10.06.02	knowledge of calculations
10.06.03	knowledge of rigging
10.06.04	knowledge of layout
10.06.05	knowledge of automated machinery
10.06.06	knowledge of forming materials
10.06.07	knowledge of the importance of grain direction in plate
10.06.08	ability to layout
10.06.09	ability to set up machinery
10.06.10	ability to use measuring tools
10.06.11	ability to form materials according to manufacturer's specifications

Sub-task

10.07 Performs in-progress inspections.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 10.07.01 knowledge of specifications
- 10.07.02 knowledge of codes related to project
- 10.07.03 knowledge of welding procedures and symbols
- 10.07.04 knowledge of quality and accuracy control
- 10.07.05 ability to use measuring devices
- 10.07.06 ability to perform a visual inspection

Sub-task

10.08 Coordinates storage prior to final assembly.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 10.08.01 knowledge of storage conditions
- 10.08.02 knowledge of storage facilities
- 10.08.03 knowledge of housekeeping around the storage area
- 10.08.04 knowledge of hand signals
- 10.08.05 knowledge of consumables
- 10.08.06 knowledge of dunnage
- 10.08.07 knowledge of hoisting and rigging equipment
- 10.08.08 ability to communicate with other tradespeople
- 10.08.09 ability to operate lifting machinery

BLOCK D

ASSEMBLY OF COMPONENTS

Trends: Increased use of out-sourcing production to specialty shops (cutting, detailing, bending, rolling, powder coating). Increased use of synthetic lifting devices and fibreglass components. New designs of preset bolts with torques built into the fasteners are finding their way into the workplace. Due to cost effectiveness, better coating methods and an environmentally-friendly consciousness, there is an increased diversity of coating materials.

Task 11 Fits and fastens components and subcomponents.

Related Documents: Schedules, shop drawings and sketches, detail drawings, welding procedures, quality assurance manuals.

Tools and Equipment: Various clamping equipment, basic hand tools, cutting equipment, welding equipment, lifting equipment (manual or powered), rigging equipment, jigs and fixtures, basic power tools, personal protective equipment, measuring tools.

Sub-task

11.01 Determines proper sequence for assembly. Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

11.01.01 knowledge of job planning and scheduling

11.01.02 knowledge of available equipment

11.01.03 ability to identify sequence of assembly components

Sub-task

11.02 Ensures proper identification of subcomponents and components. Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

11.02.01 knowledge of materials

Supporting Knowledge & Abilities

- 11.02.02 knowledge of related trade drawings
- 11.02.03 ability to use marking devices

Sub-task

11.03 Assembles subcomponents and components.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 11.03.01 knowledge of various types of bolts
- 11.03.02 knowledge of hand tools and power tools
- 11.03.03 knowledge of welding specifications and procedures
- 11.03.04 knowledge of assembly practices
- 11.03.05 ability to use measuring tools
- 11.03.06 ability to operate welding machines
- 11.03.07 ability to use hand tools
- 11.03.08 ability to use power tools
- 11.03.09 ability to use clamping devices
- 11.03.10 ability to set up machinery
- 11.03.11 ability to tack weld

Sub-task

11.04 Performs inspection.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 11.04.01 knowledge of welding codes
- 11.04.02 knowledge of quality assurance and quality control inspection methods

Supporting Knowledge & Abilities

11.04.03	knowledge of inspection methods
11.04.04	knowledge of project specifications
11.04.05	knowledge of measuring devices
11.04.06	ability to use measuring devices
11.04.07	ability to perform visual inspections
11.04.08	ability to perform mechanical inspections

Task 12 **Performs welding activities.**

Related Documents: Templates, shop drawings and sketches, job specifications, welding symbol handbook, steel handbook.

Tools and Equipment: Welding equipment, personal protective equipment, power tools, hoisting equipment.

Sub-task

12.01 **Identifies welding process.**

Supporting Knowledge & Abilities

<u>NL</u>	<u>MS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

12.01.01	knowledge of theory and application of applicable welding processes (e.g. SMAW, GTAW, FCAW, GMAW)
12.01.02	knowledge of federal, provincial and territorial legislation and codes
12.01.03	ability to read and interpret weld symbols
12.01.04	ability to identify materials of components

Sub-task

12.02 Prepares joint.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

12.02.01	knowledge of cutting, grinding and shaping tools
12.02.02	knowledge of cutting, grinding and shaping processes
12.02.03	knowledge of parent metals
12.02.04	ability to select appropriate cutting, grinding and shaping tools
12.02.05	ability to use appropriate cutting, grinding and shaping tools

Sub-task

12.03 Fits joint.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

12.03.01	knowledge of welding processes
12.03.02	knowledge of welding preparation
12.03.03	knowledge of joint specifications
12.03.04	ability to determine alignment tolerances
12.03.05	ability to select alignment tools
12.03.06	ability to use alignment tools

Sub-task

12.04 Performs tack weld.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

12.04.01	knowledge of welding theory, processes and procedures
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Supporting Knowledge & Abilities

12.04.02	knowledge of codes and symbols
12.04.03	knowledge of material types
12.04.04	knowledge of electrode types
12.04.05	ability to identify parent metals
12.04.06	ability to select filler material
12.04.07	ability to perform tack weld
12.04.08	ability to visually inspect weld

Sub-task

12.05 Welds joint.

Supporting Knowledge & Abilities

(NOT COMMON CORE)

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
no	no	NV	no	NV	NV	NV	yes	no	yes	ND	ND	ND
							12.05.01	knowledge of welding processes				
							12.05.02	ability to identify appropriate welding process				
							12.05.03	ability to select filler materials				
							12.05.04	ability to perform welding process according to specifications				
							12.05.05	ability to detect welding problems (impurities, etc.)				
							12.05.06	ability to correct welding problems (impurities, etc.)				

Task 13 **Prepares final products for finishes.**

Related Documents: Finishing specifications, contract specifications, shop drawings and sketching, galvanized specifications.

Tools and Equipment: Basic power tools, finishing tools and equipment (as per Appendix "A"), personal protective equipment.

Sub-task

13.01 **Identifies specifications for finishes.**

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 13.01.01 knowledge of power tools (refer to Appendix "A")
- 13.01.02 knowledge of coating requirements
- 13.01.03 knowledge of finishing specifications
- 13.01.04 knowledge of cutting equipment
- 13.01.05 knowledge of preparation methods
- 13.01.06 ability to use power tools
- 13.01.07 ability to select proper preparation method for finishes
- 13.01.08 ability to use cutting equipment

Sub-task

13.02 **Sorts assemblies for specific finishes.**

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

- 13.02.01 knowledge of organizational skills
- 13.02.02 knowledge of rigging and lifting
- 13.02.03 ability to communicate with other tradespeople

Task 14 **Loads finished assemblies.**

Related Documents: Dunnage or false work, sequence of components, shipping documents.

Tools and Equipment: Hoisting and rigging equipment, transporting equipment, personal protective equipment.

Sub-task**14.01** **Identifies piece marks to be shipped.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

14.01.01 knowledge of shipping documents

14.01.02 ability to cross check finished assembly to match shipping bills

Sub-task**14.02** **Determines weight of finished assemblies.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

14.02.01 knowledge of shipping documents

14.02.02 knowledge of measuring tools

14.02.03 ability to calculate weights

Sub-task**14.03** **Coordinates sequence of loading.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	no	yes	ND	ND	ND

14.03.01 knowledge of trade related drawings

14.03.02 knowledge of crane operations

Supporting Knowledge & Abilities

- 14.03.03 knowledge of loading sequences
- 14.03.04 knowledge of rigging and hoisting
- 14.03.05 ability to communicate with other tradespeople and company
- 14.03.06 ability to use communication devices

Sub-task

14.04 Determines dunnage and false work requirements to specifications.

Supporting Knowledge & Abilities

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	no	yes	ND	ND	ND

- 14.04.01 knowledge of protective measures for shipping
- 14.04.02 knowledge of weights
- 14.04.03 knowledge of tie down methods
- 14.04.04 ability to identify protective materials
- 14.04.05 ability to use protective materials
- 14.04.06 ability to determine rigging procedures

Task 15 Installs on-site.

Related Documents:

Shop drawings and sketches, safety codes, measuring devices, orientation (if required), trade related drawings, installation drawings.

Tools and Equipment:

Hoisting and rigging equipment (power or manual), welding equipment, cutting equipment, oxy-fuel equipment, layout equipment, hand and power tools, mobile ground machinery, dunnage, personal protective equipment.

Sub-task**15.01 Establishes area for installation. Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	no	no	ND	ND	ND

15.01.01 knowledge of safety requirements at the job site (gases, electrical, refinery, hospital)

15.01.02 ability to communicate with other personnel

15.01.03 ability to interpret site drawings

Sub-task**15.02 Establishes lay down area. Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	no	no	ND	ND	ND

15.02.01 knowledge of shipping documents

15.02.02 knowledge of city codes, by-laws and regulations

15.02.03 ability to determine dunnage requirements

Sub-task**15.03 Determines required equipment. Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	no	no	ND	ND	ND

15.03.01 knowledge of rigging

15.03.02 ability to communicate with other tradespeople in the field

15.03.03 ability to perform rigging practices

Sub-task**15.04** **Determines required consumables.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	no	no	ND	ND	ND

15.04.01 knowledge of specifications

15.04.02 knowledge of welding procedures

15.04.03 ability to communicate with suppliers and personnel

Sub-task**15.05** **Confirms field dimensions.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	no	no	ND	ND	ND

15.05.01 knowledge of measuring devices

15.05.02 ability to transfer field dimensions to drawings

Sub-task**15.06** **Installs components.****Supporting Knowledge & Abilities**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>
yes	yes	NV	yes	NV	NV	NV	yes	no	no	ND	ND	ND

15.06.01 knowledge of fastening

15.06.02 knowledge of welding procedures

15.06.03 knowledge of customer contract requirements

15.06.04 knowledge of personnel requirements

15.06.05 knowledge of codes, by-laws and regulations

15.06.06 knowledge of required modifications on field sites

15.06.07 ability to recognize time of completion or schedule

Supporting Knowledge & Abilities

- 15.06.08 ability to verify area to drawing (orientation)
- 15.06.09 ability to sequence components
- 15.06.10 ability to perform final inspection
- 15.06.11 ability to adjust components on site
- 15.06.12 ability to modify components to accepted standards
- 15.06.13 ability to join components

APPENDICES

TOOLS AND EQUIPMENT

Personal Safety Equipment

dust mask	respirator
face shields	safety boots
fire resistant clothing	safety glasses
gloves	safety harness
hard hats	self-contained breathing apparatus (SCBA)
hearing protectors	welding helmets
reflective gauntlet	
reflective vest and coveralls	

Basic Hand Tools

assorted wrenches	plum bob
ballpeen hammer	punches
bar clamps	sledge hammer
c-clamps	squares
dogs and wedges	steel thickness gauge
drift pins	tape measure
file	toggle clamps
hand magnets	torque wrench
hi/low gauge	transits
locking grips	various levels
measuring tools	vernier callipers

Drafting and Other Office Equipment

reference manuals for codes, materials and layout	steel handbook
scientific calculator	

Basic Power Tools

angle grinder	hydraulic power tools
air tools	magnetic drill
bench grinder	pneumatic tools
concrete drills	power actuated tools (wrenches, rivetters)
core drill	punches/rams
explosive activated tools	reamer drill
hammer drill	

Welding Equipment

anti spatter paste/gel/spray	ground clamps
carbon air arc gouging	mig pliers
chipping hammer	oxy-fuel welding
electrical resistance welding (ERW)	thermal electrode device (TED)
equipment for shielded metal arc	welding (SMAW)
flux core welding (FCAW)	welding cables
gas metal arc welding (MIG)	welding gauge
gas tungsten arc welding (TIG)	wire brush

Rigging Equipment

blocks	plate clamps
chain cinch	rope and tackle
chain falls	shackles
chain slings	spreader bars
come-along	synthetic ropes
endless sling assemblies	synthetic slings
hydraulic and manual jacks	Tirfor TM
manilla rope	tuggers
mesh slings	turnbuckles
personnel basket	wire rope slings

Elevated Work Plate Form

ladders	powered personnel lifts
personnel basket	scaffolds

Material Handling Equipment

bridge crane	magnetic crane
fork lift	overhead crane
hydraulic cranes	

Layout Equipment

ballpeen hammer	piano wire
beam board	protractor
beam gauge	scribe
bevel square	small clamps
centre finder	soap stone
centre punch	straight edge
chalk line	templates
combination square	transfer punches
divider	transits
hand magnet	trammel points
measuring tape	various squares
paint marker	

Cutting Equipment

angle shear	nibblers
band saw	oxy-fuel torches
bevellers	pipe cutters
dry cutter saw	power hack saw
friction saw	vertical saw
hand shear	
mechanical, electric and hydraulic shears	

Drilling (and related) Equipment

blocks	micrometers
callipers	pedestal drill
core drills (cutters)	portable hand drill
drill bits	punches and dies
drill gauges	radial arm drill
drill press	reamers
drill press vice	standard upright drill
hold down clamps	tap and dies
magnetic drill	

Bending and Shaping Equipment

beam line	portapower
CNC process equipment	press brake
cold section bender	punches
fixed and portable mechanical and hydraulic punch presses	shape/manual die bender
ironworker	straightening machine
manual shape bender	various dies

Finishing Tools and Equipment

angle grinder	pencil grinder (die)
assorted finishing discs	sand blaster
belt sander	sander
buffers	wheelabrator
chippers	wire brush
hand brush	wire wheels

GLOSSARY

blocking	shimming metal plate for the purpose of levelling or support
blueprint reading	the systematic and methodical interpretation of various lines, symbols, views, dimensions, written notes and specifications
Computer Numerical Control (CNC)	a control system in which numerical values corresponding to a desired tool or control positions are generated by a computer/computer program
coping	the removal of material in flange, web of beam or channel
detail drawings	the transferring of information from a customer supplied drawing into detailed drawings to simplify the manufacturing of custom steel fabricated components
dimensioning	a process of assigning dimensions to a mechanical drawing
dunnage or falsework	wood or other materials used to support or protect components
FCAW	flux core arc welding
flame cutting	cutting that uses the flame of an oxy-fuel torch and high pressure stream of oxygen
ironworker	a tool that performs a number of tasks including plate and bar shearing, coping and mitring of structural shapes, punching and bending operations
jig	a device used to position and hold parts for assembly and repetitive (or other) operations
layout	the process of transferring lines, centres, and other informative markings from the blueprint
mig welding (GMAW)	metal inert gas (mig) welding
MSDS	material safety data sheets
nesting	utilizing material to achieve the least waste
nibbling	removing material for required inverted openings

notching	the process of making a cut that removes an amount of material
numerical control	transfer of information for data control
plate roll	a power machine used to roll steel plate into the desired shape according to drawings
press brake	a power machine used to produce bends in plate steel
Q.A. manual	quality assurance manual
SOP	standard operating procedures
stick welding (SMAW)	a common shop term for shielded metal arc welding (SMAW) which uses a flux coated electrode
structural drawings	design drawings that show plans, sections, details, and elevations required for construction. They also include the sizes and general arrangement
tack weld	used to hold parts in alignment
template	a gauge or pattern used as a guide to replicate a piece being fabricated
tig welding (GTAW)	tungsten inert gas (tig) welding
tirfor	a hand operated pulling or hoisting device
tolerance	a permissible deviation from a specified dimension
torque tightening	the tightening of nuts and bolts to a given specification
trammel points	a compass for drawing large circles that consists of a beam with two sliding parts
trial assembly	to assemble the actual component or sub-component to be produced on a temporary basis in order to ensure correct fit

BLOCKS AND TASKS WEIGHTING

BLOCK A OCCUPATIONAL SKILLS

													National Average 21%
%	<u>NL</u> 15	<u>NS</u> 10	<u>PE</u> NV	<u>NB</u> 35	<u>QC</u> NV	<u>ON</u> NV	<u>MB</u> NV	<u>SK</u> 7	<u>AB</u> 30	<u>BC</u> 30	<u>NT</u> ND	<u>YK</u> ND	<u>NU</u> ND

Task 1 Demonstrates common trade practices.

%	<u>NL</u> 20	<u>NS</u> 20	<u>PE</u> NV	<u>NB</u> 23	<u>QC</u> NV	<u>ON</u> NV	<u>MB</u> NV	<u>SK</u> 20	<u>AB</u> 20	<u>BC</u> 30	<u>NT</u> ND	<u>YK</u> ND	<u>NU</u> ND	22%
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Task 2 Utilizes various shop drawings, sketches and fabrication drawings.

%	<u>NL</u> 60	<u>NS</u> 45	<u>PE</u> NV	<u>NB</u> 60	<u>QC</u> NV	<u>ON</u> NV	<u>MB</u> NV	<u>SK</u> 60	<u>AB</u> 40	<u>BC</u> 35	<u>NT</u> ND	<u>YK</u> ND	<u>NU</u> ND	50%
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Task 3 Employs tools, equipment and measuring instruments.

%	<u>NL</u> 20	<u>NS</u> 35	<u>PE</u> NV	<u>NB</u> 17	<u>QC</u> NV	<u>ON</u> NV	<u>MB</u> NV	<u>SK</u> 20	<u>AB</u> 40	<u>BC</u> 35	<u>NT</u> ND	<u>YK</u> ND	<u>NU</u> ND	28%
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BLOCK B JOB PLANNING AND PREPARATION

													National Average 14%
%	<u>NL</u> 5	<u>NS</u> 15	<u>PE</u> NV	<u>NB</u> 15	<u>QC</u> NV	<u>ON</u> NV	<u>MB</u> NV	<u>SK</u> 3	<u>AB</u> 24	<u>BC</u> 20	<u>NT</u> ND	<u>YK</u> ND	<u>NU</u> ND

Task 4 Receives materials.

%	<u>NL</u> 10	<u>NS</u> 20	<u>PE</u> NV	<u>NB</u> 16	<u>QC</u> NV	<u>ON</u> NV	<u>MB</u> NV	<u>SK</u> 10	<u>AB</u> 10	<u>BC</u> 30	<u>NT</u> ND	<u>YK</u> ND	<u>NU</u> ND	16%
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Task 5 Identifies materials.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	
%	60	20	NV	25	NV	NV	NV	40	20	30	ND	ND	ND	32%

Task 6 Develops individual job plan and schedule.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	
%	10	30	NV	20	NV	NV	NV	10	30	25	ND	ND	ND	21%

Task 7 Prepares work area and equipment schedules.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	
%	20	30	NV	39	NV	NV	NV	40	40	15	ND	ND	ND	31%

BLOCK C FABRICATION OF COMPONENTS

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	National Average
%	50	40	NV	35	NV	NV	NV	55	40	35	ND	ND	ND	42%

Task 8 Handles materials.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	
%	7	15	NV	18	NV	NV	NV	10	15	25	ND	ND	ND	15%

Task 9 Performs layout.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	
%	43	45	NV	47	NV	NV	NV	45	45	50	ND	ND	ND	46%

Task 10 Fabricates detail materials.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	
%	50	40	NV	35	NV	NV	NV	45	40	25	ND	ND	ND	39%

BLOCK D

ASSEMBLY OF COMPONENTS

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	National Average
%	30	35	NV	15	NV	NV	NV	35	10	15	ND	ND	ND	23%

Task 11 Fits and fastens components and subcomponents.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	
%	47	35	NV	30	NV	NV	NV	75	60	50	ND	ND	ND	49%

Task 12 Performs welding activities.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	
%	22	35	NV	21	NV	NV	NV	15	10	26	ND	ND	ND	22%

Task 13 Prepares final product for finishes.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	
%	12	10	NV	18	NV	NV	NV	5	20	12	ND	ND	ND	13%

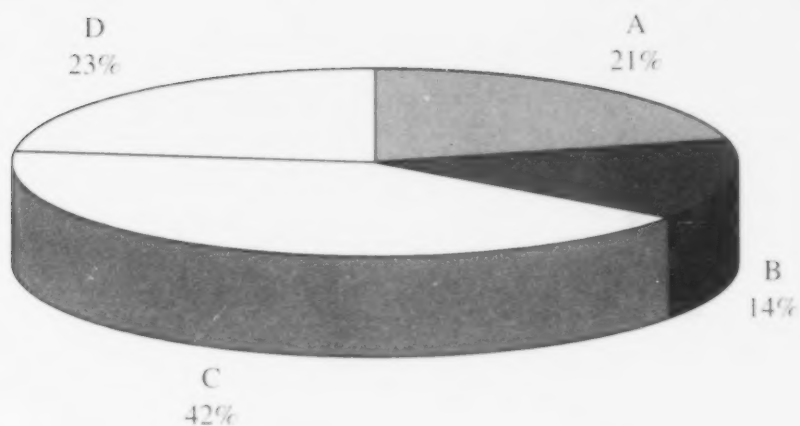
Task 14 Loads finished assemblies.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	
%	9	15	NV	11	NV	NV	NV	2	10	12	ND	ND	ND	10%

Task 15 Installs on-site.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YK</u>	<u>NU</u>	
%	10	5	NV	20	NV	NV	NV	3	0	0	ND	ND	ND	6%

PIE CHART*
Metal Fabricator (Fitter)



TITLES OF BLOCKS

Block A	Occupational Skills	Block C	Fabrication of Components
Block B	Job Planning and Preparation	Block D	Assembly of Components

* The average percentage of the total number of questions on an interprovincial examination, assigned to assess each block of the analysis, as derived from the collective input of workers within the occupation from all areas of Canada. Interprovincial examinations typically have from one hundred to one hundred and fifty multiple-choice questions on each examination.



METAL FABRICATOR

BLOCKS		TASKS		←				SU	
A	Occupational Skills	1. Demonstrates common trade practices.	1.01 Uses personal protective equipment.	1.02 Complies with current codes and regulations.	1.03 Follows standard operating procedures (SOP).	1.04 Manages work area.			
	2. Utilizes various shop drawings, sketches and fabrication drawings.	2.01 Interprets drawings.	2.02 Interprets engineering specifications.	2.03 Creates bill of materials.					
	3. Employs tools, equipment and measuring instruments.	3.01 Uses hand tools.	3.02 Operates power tools.	3.03 Operates stationary machinery.	3.04 Operates equipment.				
B	Job Planning and Preparation	4. Receives materials.	4.01 Documents receipts of components.	4.02 Coordinates lay down area.	4.03 Identifies structural components and pieces.	4.04 Identifies consumables.			
	5. Identifies materials.	5.01 Verifies materials as per job specifications.	5.02 Marks materials.	5.03 Sequences required materials.	5.04 Marks consumables as per specifications.				
	6. Develops individual job plan and schedule.	6.01 Estimates size of project.	6.02 Identifies sub-assemblies.						
		7. Prepares work area and equipment schedules.	7.01 Establishes size of area.	7.02 Determines equipment requirements.	7.03 Determines schedules.				
	C	Fabrication of Components	8. Handles materials.	8.01 Verifies piece marks.	8.02 Determines weights.	8.03 Identifies lifting points.	8.04 Marks materials.		
		9. Performs layout.	9.01 Prepares materials.	9.02 Determines layout methods.	9.03 Calculates material allowances for various processes.	9.04 Determines dimensions.			

METAL FABRICATOR (FITTER) (2003)

APPENDIX "E"

SUB-TASKS

1.01	1.02 Complies with current codes and regulations.	1.03 Follows standard operating procedures (SOP).	1.04 Maintains safe working area.

2.01	2.02 Interprets engineering specifications.	2.03 Creates bill of materials.

3.01	3.02 Operates power tools.	3.03 Operates stationary machinery.	3.04 Operates mobile equipment.	3.05 Uses rigging equipment.	3.06 Uses measuring devices.

4.01	4.02 Coordinates lay down area.	4.03 Identifies structural components and pieces.	4.04 Identifies consumables.

5.01	5.02 Marks materials.	5.03 Sequences required materials.	5.04 Matches consumables to specifications.

6.01	6.02 Identifies sub-assemblies.

7.01	7.02 Determines equipment requirements.	7.03 Determines schedules.

8.01	8.02 Determines weights.	8.03 Identifies lifting points.	8.04 Matches lifting equipment.	8.05 Transfers materials.

9.01	9.02 Determines layout methods.	9.03 Calculates material allowances for various processes.	9.04 Determines dimensions.	9.05 Transfers dimensions.	9.06 Makes templates.	9.07 Assembles jigs.

METAL FABRICATOR (FITTER) (2003)

BLOCKS		TASKS	SUB-TASKS						
D		10. Fabricates detail materials.	10.01 Prepares subassembly requirements.	10.02 Determines method of cutting.	10.03 Cuts components.	10.04 Applies parts numbers and piece marks.	10.05 Makes holes.	10.06 Forms materials.	10.07 Perform progress inspection.
	Assembly of Components	11. Fits and fastens components and subcomponents.	11.01 Determines proper sequence for assembly.	11.02 Ensures proper identification of subcomponents and components.	11.03 Assembles subcomponents and components.	11.04 Performs inspection.			
		12. Performs welding activities.	12.01 Identifies welding process.	12.02 Prepares joint.	12.03 Fits joint.	12.04 Performs tack weld.	12.05 Welds joint.		
		13. Prepares final products for finishes.	13.01 Identifies specifications for finishes.	13.02 Sorts assemblies for specific finishes.					
		14. Loads finished assemblies.	14.01 Identifies piece marks to be shipped.	14.02 Determines weight of finished assemblies.	14.03 Coordinates sequence of loading.	14.04 Determines storage and follow work requirements to specifications.			
		15. Installs on-site.	15.01 Establishes area for installation.	15.02 Establishes lay down area.	15.03 Determines required equipment.	15.04 Determines required consumables.	15.05 Confirms field dimensions.	15.06 Installs components.	

TASKS



Task	D105 Make holes	D106 Form materials	D107 Perform on progress completion	D108 Coordinate storage prior to final assembly

Task	G105 Weld joint

Task	G106 Coordinate final dimensions	G108 Insulate components

